

SEQUENCE LISTING**SEQ ID NO:1 Synthetic Sso7d gene**

GCAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAAGAGGTAGACATCTCCAA
 5 GATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCCTCACCTACGACGAGGG
 CGGTGGCAAGACCGGCCGTGGCGGTAAAGCGAAAAGGACGCGCCGAAGGAGC
 TGCTGCAGATGCTGGAGAAG
 CAGAAAAAG

10 SEQ ID NO:2 The amino acid sequence of Sso7d.

ATVKFKYKGEEKEVDISKIKKVVWRVGKMISFTYDEGGGKTGRGAVSEKDAPKELLQ
 MLEKQKK

SEQ ID NO:3 The DNA sequence encoding the Sso7d-ΔTaq fusion protein

15 ATGATTACGAATTGAGCGAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAAA
 GAGGTAGACATCTCCAAGATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCC
 TTCACCTACGACGAGGGCGGTGGCAAGACCGGCCGTGGCGGTAAAGCGAAAAG
 GACGCGCCGAAGGAGCTGCTGCAGATGCTGGAGAAGCAGAAAAAGGGCGGCCGG
 TGTCACTAGTCCCAGGCcCTGGAGGAGGCCCTGGCCCCCGCCGAAGGGGCC
 20 TTCGTGGCTTGCTTCCGCAAGGAGCCATGTGGCCGATCTTCTGGCCCT
 GGCGCCGCCAGGGGGGGCCGGTCCACCGGGCCCCGAGCCTTATAAGCCCT
 CAGGGACCTGAAGGAGGCGGGGGCTTCGCCAAAGACCTGAGCGTTCTGGC
 CCTGAGGGAAGGCCTTGGCTCCCGCCGGCGACGACCCATGCTCCTCGCCTAC
 CTCCTGGACCCTTCCAACACCACCCCGAGGGGGTGGCCCGCGCTACGGCGGG
 25 GAGTGGACGGAGGAGGCAGGGGGAGCGGGCCCTTCCGAGAGGCTTACCGGGAG
 AACCTGTGGGGAGGCTTGAGGGGGAGGAGAGGCTCCTTGGCTTACCGGGAG
 GTGGAGAGGCCCTTCCGCTGTCCTGGCCCACATGGAGGCCACGGGGTGC
 CTGGACGTGGCTATCTCAGGGCCTGTCCTGGAGGTGGCCGAGGAGATCGCCC
 GCCTCGAGGCCGAGGTCTCCGCTGGCCGCCACCCCTAACCTCAACTCCG
 30 GGACCAGCTGAAAGGGCTCTTGTACGAGCTAGGGCTCCGCCATGGCAA
 GACGGAGAAGACCGCAAGCGCTCCACCAGCGCCGCCGTGGAGGCCCTCCG
 CGAGGCCACCCATCGTGGAGAAGATCCTGCAGTACCGGGAGCTACCAAGCT
 GAAGAGCACCTACATTGACCCCTGCCGGACCTCATCCACCCAGGACGGCG
 CCTCCACACCCGCTCAACCAGACGGCACGGCACGGCAGGCTAAGTAGCTC

CGATCCAACCTCCAGAACATCCCCGTCCGACCCCGCTTGGCAGAGGATCCGC
CGGGCCTTCATCGCCGAGGAGGGTGGCTATTGGTGGCCCTGGACTATAGCCAG
ATAGAGCTCAGGGTGCTGGCCCACCTCTCCGGCGACGAGAACCTGATCCGGGTCT
TCCAGGAGGGCGGGACATCCACACGGAGACCGCCAGCTGGATGTTGGCGTCC
5 CCCGGGAGGCCGTGGACCCCTGATGCGCCGGCGGCCAAGACCATACTTCG
GGGTCCCTCTACGGCATGTCGGCCACCGCCTCTCCCAGGAGCTAGCCATCCCTTA
CGAGGAGGCCAGGCCTTCATTGAGCGCTACTTCAGAGCTTCCAAAGGTGCGG
GCCTGGATTGAGAAGACCCCTGGAGGAGGGCAGGAGGCCGGTACGTGGAGAC
CCTCTCGGCCGCCGCGCTACGTGCCAGACCTAGAGGCCGGTGAAGAGCGT
10 CGGGGAGGCCGTGGACCCCTGATGCGCCAGGGCACCGCCGC
CGACCTCATGAAGCTGGCTATGGTGAAGCTCTCCCAGGCTGGAGGAAATGGG
GCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGCCTCGAGGCCAAAAGA
GAGGGCGGAGGCCGTGGCCCGCTGGCCAAGGAGGTATGGAGGGGTGTATCC
CCTGGCCGTGCCCTGGAGGTGGAGGTGGGATAGGGAGGACTGGCTCTCCGC
15 CAAGGAGGGCATTGATGGCCGGCGGAGGCCGGCATCATCATCATCATCAT
A

SEQ ID NO:4 The amino acid sequence of Sso7d-ΔTaq fusion protein

MITNSSATVKFKYKGEKEVDISKIKKVWRVGKMISFTYDEGGGKTGRGA VSEKDA
20 PKELLQMLEKQKKGGVTSPKALEEAPWPPPEGAFVGFLSRKEPMWADLLALAA
ARGGRVHRAPEPYKALRDLKEARGLLAKDLSVLALREGLGLPPGDDPMLLAYLLDP
SNTTPEGVARRYGGEWTEEAGERAALSERLFANLWGRLEGEERLLWLYREVERPLS
AVLAHMEATGVRLDVAYLRALSLEVAAEIIARLEAEVFRLAGHPFNLNSRDQLERVLF
DELGLPAIGKTEKTGKRSTSAAVLEALREAHPIVEKILQYRELTKLKSTYIDPLPDLIH
25 PRTGRLHTRFNQTATATGRLSSSDPNLQNIPVRTPLGQRIRRAFIAEEGWLLVALDYS
QIELRVLAHLSGDENLIRVFQEGRDIHTETASWMFGVPREAVDPLMRRAKTINFGV
LYGMSAHLRSQELAIPYEEAQAFIERYFQSFPKVRAWIEKTLEEGRRRGYVETLFGR
RYVPDLEARVKSvreAAERMAFNMPVQGTAADLMKLAMVKLFPRLEEMGARMLL
QVHDELVLEAPKERAEEAVARLAKEVMEGVYPLAVPLEVEVGIGEDWLSAKEGIDGR
30 GGGGHHHHHH

SEQ ID NO:5 The DNA sequence encoding the Sso7d-Taq fusion protein

ATGATTACGAATTCGAGCGAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAA

GAGGTAGACATCTCCAAGATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCC
TTCACCTACGACGAGGGCGGTGGCAAGACCGGCCGTGGTGCCTGAAGCGAAAAG
GACGCCGAAGGAGCTGCTGCAGATGCTGGAGAAGCAGAAAAAGGGCGGCCGG
TGTCACTAGTGGATGCTGCCCTTTGAGCCAAGGGCGGGTCTCCTGGT
5 GACGCCACCACCTGGCCTACCGCACCTCCACGCCCTGAAGGGCCTCACCA
GCCGGGGGGAGCCGGTGCAGGCCGTCTACGGCTGCCAAGAGCCTCCTCAAGG
CCCTCAAGGAGGACGGGACGCCGTACGGGGTACAAGGCCGGCCCCACGCCAG
CCTCCGCCACGAGGCCTACGGGGTACAAGGCCGGCCCCACGCCAG
AGGACTTTCCCCGGCAACTGCCCTCATCAAGGAGCTGGTGGACCTCCTGGGCT
10 GGCGGCCCTCGAGGTCCGGCTACGAGGCCGACGACGTCTGGCAGCCTGGC
CAAGAAGGCCGAAAAGGAGGGTACGAGGTCCGCATCCTCACCGCCGACAAAG
ACCTTACCAAGCTCCTTCCGACCGCATCCACGTCCACCCGAGGGTACCT
CATCACCCGGCCTGGCTTGGAAAAGTACGGCTGAGGCCGACAGTGGC
CGACTACCGGCCCTGACCGGGGACGAGTCCGACAACCTCCCAGGGTCAAGGG
15 CATCGGGGAGAACCGCGAGGAAGCTTCTGGAGGAGTGGGGAGCCTGGAAG
CCCTCCTCAAGAACCTGGACCGGCTGAAGCCGCATCCGGAGAACATCCTGG
CCCACATGGACGATCTGAAGCTCTGGACCTGGCAAGGTGCGCACCGACCT
GCCCTGGAGGTGGACTTCGCCAAAAGGCCGGAGCCCGACCGGGAGAGGCTTAG
GGCCTTCTGGAGAGGGTTGAGTTGGCAGCCTCCACGAGTTGGCCTTG
20 GAAAGCCCCAAGGCCTGGAGGAGGCCCTGGCCCCCGCCGGAGGGCCTTC
GTGGCTTGTGCTTCCGCAAGGAGCCATGTGGCCGATCTTCTGGCCCTGG
CCGCCGCCAGGGGGGCCGGTCCACCGGGCCCCGAGCCTATAAACCCCTCA
GGGACCTGAAGGAGGCCGGCTCTGCCAAAGACCTGAGCGTTCTGGCCC
TGAGGGAGGCCTTGGCCTCCGCCGGCGACGACCCATGCTCCTCGCCTACCT
25 CCTGGACCCCTCCAACACCACCCCGAGGGGTGGCCCGCTACGGCGGGGA
GTGGACGGAGGAGGCCGGAGCGGGCCCTTCCGAGAGGCTCTGGCCAA
CCTGTGGGGAGGCTTGAGGGAGGAGAGGCTCTGGCTTACCGGGAGGT
GGAGAGGCCCTTCCGCTGCTGGCCACATGGAGGCCACGGGGTGCCT
GGACGTGGCCTATCTCAGGGCCTGTCCTGGAGGTGGCCGAGGAGATGCCCG
30 CCTCGAGGCCGAGGTCTCCGCCCTGGCCGCCACCCCTCAACCTCAACTCCGG
GACCAGCTGGAAAGGGCCTTTGACGAGCTAGGGCTCCGCCATGGCAAG
ACGGAGAAGACCGCAAGCGCTCCACCGGCCGCCGTGGAGGCCCTCCGC
GAGGCCACCCATCGTGAGAAGATCCTGCAGTACCGGGAGCTACCAAGCTG
AAGAGCACCTACATTGACCCCTGCCGGACCTCATCCACCCAGGACGGCGCC

TCCACACCGCTTCAACCAGACGCCACGCCACGGCAGGCTAAGTAGCTCCG
 ATCCCAACCTCCAGAACATCCCCGTCCGCACCCGCTGGCAGAGGATCCGCCG
 GGCCTTCATGCCGAGGAGGGTGGCTATTGGTGGCCCTGGACTATAGCCAGAT
 AGAGCTCAGGGTGTGGCCCACCTCTCCGGCGACGAGAACCTGATCCGGTCTC
 5 CAGGAGGGCGGGACATCCACACGGAGACGCCAGCTGGATGTTCGGCGTCCCC
 CGGGAGGCCGTGGACCCCTGATGCCCGGGCGCCAAGACCATAACTTCGGG
 GTCCTCTACGGCATGTCGGCCCACCGCCTCTCCAGGAGCTAGCCATCCCTTACG
 AGGAGGCCAGGCCTTCATTGAGCGCTACTTCAGAGCTTCCAAAGGTGCGGGC
 CTGGATTGAGAAGACCCCTGGAGGAGGGCAGGAGGCAGGGTACGTGGAGACCC
 10 TCTTCGGCCGCCGCTACGTGCCAGACCTAGAGGCCGGGTGAAGAGCGTGC
 GGGAGGCCGAGCGCATGCCCTAACATGCCGTCCAGGGCACGCCCG
 ACCTCATGAAGCTGGCTATGGTAAGCTCTCCCCAGGCTGGAGGAAATGGGGG
 CCAGGATGCTCCTCAGGTCCACGACGAGCTGGCCTCGAGGCCAAAAGAGA
 GGGCGGAGGCCGTGGCCCGCTGGCCAAGGAGGTATGGAGGGGTATCCCC
 15 TGGCGTGCCCTGGAGGTGGAGGTGGGATAGGGAGGACTGGCTCTCCGCA
 AGGAGGGCATTGATGCCCGGGAGGCAGGGCATCATCATCATCATTAA

SEQ ID NO:6 The amino acid sequence of Sso7d-Taq fusion protein.

MITNSSATVKFKYKGEKEVDISKIKKVWRVGKMISFTYDEGGKTRGAVSEKDA
 20 PKELLQMLEKQKKGGVTSGMLPLFEPKGRVLLVDGHHLAYRTFHALKGLTSRGE
 PVQAVYGFAKSLLKALKEDGDAIVVFDAKAPSFRHEAYGGYKAGRAPTPEDFPRQ
 LALIKELVDLLGLARLEVPGYEADDVLASLAKKAEKEGYEVRLTADKDLYQLLSDR
 IHVLHPEGYLITPAWLWEKYGLRPDWADYRALTGDESDNLPGVKIGEKTARKLL
 EEWGSLEALLKNLDRLKPAIREKILAHMDDLKLSWDLAKVRTDLPLEVDFAKRREP
 25 DRERLRAFLERLEFGSLLHEFGLLESPKALEEAPWPPPEGAFVGFVLSRKEPMWADL
 LALAAARGGRVHRAPEPYKALRDLKEARGLLAKDLSVLALREGLGLPPGDDPMILLA
 YLLDPSNTTPEGVARRYGGEWTEEAGERAALSERLFANLWGRLEGEERLLWLYREV
 ERPLSAVLAHMEATGVRLDVAYLRLSLEVAEEIARLEAEVFRLAGHPFNLNSRDQL
 ERVLFDELGLPAIGKTEKTGKRSTSAAVLEALREAHPIVEKILQYRELTKLKSTYIDPL
 30 PDLIHPRTGRLHTRFNQTATATGRLSSDPNLQNIPVRTPLGQRIRRAFIAEEGWLLVA
 LDYSQIELRVLAHLSGDENLIRVFQEGRDIHTETASWMFGVPREAVDPLMRRAAKTI
 NFGVLYGMSAHRSQLAIPYEEAQAFIERYFQSFPKVRAWIEKTLEEGRRRGYVETL
 FGRRRYVPDLEARVKSvreAAERMAFNMPVQGTAADLMKLAMVKLFPRLEEMGA

RMLLQVHDELVLEAPKERAEEAVARLAKEVMEGVYPLAVPLEVEVGIGEDWLSAKE
GIDGRGGGGHHHHHH

SEQ ID NO:7 The DNA sequence encoding the Pfu-Sso7d fusion protein

5 ATGATTTAGATGTGGATTACATAACTGAAGAAGGAAAACCTGTTATTAGGCTAT
TCAAAAAAGAGAACGGAAAATTAAAGATAGAGCATGATAGAACTTTAGACC
ACATTTACGCTCTCAGGGATGATTCAAAGATTGAAGAAGTTAAGAAAATAAC
GGGGAAAGGCATGGAAAGATTGTGAGAATTGTTGATGTAGAGAAGGTTGAGAA
AAAGTTCTCGCAAGCCTATTACCGTGTGGAAACTTATTGGAACATCCCCAA
10 GATGTTCCCACATTAGAGAAAAAGTTAGAGAACATCCAGCAGTTGTGGACATCT
TCGAATACGATATTCCATTGCAAAGAGACACCTCATCGACAAAGGCCTAATACC
AATGGAGGGGAAGAACAGAGCTAAAGATTCTGCCTCGATATAGAAACCCTCTA
TCACGAAGGAGAACAGAGTTGGAAAAGGCCAATTATAATGATTAGTTATGCAGA
TGAAAATGAAGCAAAGGTGATTACTTGGAAAAACATAGATCTCCATACGTTGA
15 GGTTGTATCAAGCGAGAGAGAGATGATAAAGAGATTCTCAGGATTATCAGGGA
GAAGGATCCTGACATTATAGTTACTTATAATGGAGACTCATTGACTTCCATAT
TTAGCGAAAAGGGCAGAAAAACTTGGGATTAAATTAACCATTGGAAGAGATGGA
AGCGAGCCAAGATGCAGAGAACAGGCGATATGACGGCTGTAGAAGTCAAGGG
AAGAATACATTGACTTGTATCATGTAATAACAAGGACAATAATCTCCAAACA
20 TACACACTAGAGGCTGTATATGAAGCAATTGGAAAGCCAAAGGAGAACGGTA
TACGCCGACGAGATAGCAAAAGCCTGGAAAGTGGAGAGAACCTTGAGAGAGTT
GCCAAATACTCGATGGAAGATGCAAAGGCAACTTATGAACTCGGGAAAGAAC
CTTCCAATGGAAATTCAAGCTTCAAGATTAGTTGGACAACCTTATGGGATGTT
CAAGGTCAAGCACAGGAAACCTGTAGAGTGGTTCTACTTAGGAAAGCCTACG
25 AAAGAAACGAAGTAGCTCAAACAAGCCAAGTGAAGAGGGAGTCAAAAGAAGG
CTCAGGGAGAGCTACACAGGTGGATTGTTAAAGAGGCCAGAAAAGGGTTGTGG
GAAAACATAGTACCTAGATTAGCCCTATATCCCTCGATTATAATTACCC
ACAATGTTCTCCGATACTCTAAATCTGAGGGATGCAAGAACATGATATCGC
TCCTCAAGTAGGCCACAAGTTCTGCAAGGACATCCCTGGTTATACCAAGTCTC
30 TTGGGACATTGTTAGAGGAAAGACAAAAGATTAAGACAAAATGAAGGAAACT
CAAGATCCTATAGAAAAAAACTCCTGACTATAGACAAAAGCGATAAAACTC
TTAGCAAATTCTTCTACGGATATTATGGCTATGCAAAAGCAAGATGGTACTGTA
AGGAGTGTGCTGAGAGCGTTACTGCCTGGGAAGAAAGTACATCGAGTTAGTAT
GGAAGGAGCTCGAAGAAAAGTTGGATTAAAGTCCTCTACATTGACACTGATG

T00050-25502860

GTCTCTATGCAACTATCCCAGGAGGAGAAAGTGAGGAAATAAAGAAAAAGGCTC
TAGAATTGTAAAATACATAAATTCAAAGCTCCCTGGACTGCTAGAGCTTGAATA
TGAAGGGTTTATAAGAGGGATTCTCGTTACGAAGAAGAGGTATGCAGTAAT
AGATGAAGAAGGAAAAGTCATTACTCGTGGTTAGAGATAGTTAGGAGAGATTG
5 GAGTGAAATTGCAAAAGAAACTCAAGCTAGAGTTGGAGACAATACTAAAACA
CGGAGATGTTGAAGAAGCTGTGAGAATAGTAAAGAAGTAATACAAAAGCTTGC
CAATTATGAAATTCCACCAGAGAAGCTCGCAATATGAGCAGATAACAAGACC
ATTACATGAGTATAAGGCAGATAGGTCTCACGTAGCTGTTGCAAAGAAAAGCT
GCTAAAGGAGTTAAAATAAGCCAGGAATGGTAATTGGATACATAGTACTTAGA
10 GGCATGGTCCAATTAGCAATAGGGCAATTCTAGCTGAGGAATACGATCCAAA
AAGCACAAGTATGACGCAGAATATTACATTGAGAACCAAGGTTCTCCAGCGGT
CTTAGGATATTGGAGGGATTGGATACAGAAAGGAAGACCTCAGATACCAAAAG
ACAAGACAAGTCGGCTAACTCCTGGCTAACATTAAAAATCCGGTACCGGC
GGTGGCGGTGCAACCGTAAAGTTCAAGTACAAAGGCGAAGAAAAAGAGGTAGA
15 CATCTCCAAGATCAAGAAAGTATGGCGTGTGGCAAGATGATCTCCTTCACCTAC
GACGAGGGCGGTGGCAAGACCGGCCGTGGTGGTAAGCGAAAAGGACGCGCC
GAAGGAGCTGCTGCAGATGCTGGAGAAGCAGAAAAAGTGA

SEQ ID NO:8 The amino acid sequence of the Pfu-Sso7d fusion protein

20 MILDVDYITEEGKPVIRLFKKENGKFIEHDRTFRPYIYALLRDDSKIEEVKKITGERH
GKIVRIVDVEKVEKKFLGKPITVWKLYLEHPQDVPTIREKVREHPAVVDIFEYDIPFA
KRYLIDKGLIPMEEEELKILAFDIETLYHEGEFGKGPIIMISYADENEAKVITWKNID
LPYVEVVSSEREMIKRFLRIIREKDPIIPTYNGDSFDPYLAKRAEKGKLTIGRDGS
EPKMQRIGDMTAVEVKGRHFIDLYHVITRTINLPTYTLEAVYEAFGKPKEKVYADEI
25 AKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLWDVRSSTGN
LVEWFLLRKAYERNEVAPNKPSEEEYQRRLRESYTGGFVKEPEKGLWENIVYLDFR
ALYPSIIITHNVSPDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLEERQKIKTK
MKETQDPIEKILLDYRQKAIKLLANSFYGYGYAKARWYCKECAESVTAWGRKYIE
LVWKELEEKFGFKVLYIDTDGLYATIPGGESEEIKKALEFVKYINSKLPGLELEYE
30 GFYKRGFFVTKKRYAVIDEEGKVITRGLIEVRRDWSEIAKETQARVLETILKHGDVEE
AVRIVKEVIQKLANYEIPPEKLAIFIYEQITRPLHEYKAIGPHVAVAKKLAAGVKIKPG
MViGYIVLRGDGPISNRAILAEYDPKKHKYDAEYYIENQVLPAVRLILEGFGYRKED
LRYQKTRQVGLTSWLNIKSGTGGGGATVKFKYKGEEKEVDISKIKKVVWRVGKMS
FTYDEGGGKTGRGAVSEKDAPKELLQMELKQKK

SEQ ID NO:9 The DNA sequence encoding the Sac7d-ΔTaq fusion protein

ATGATTACGAATTCGACGGTGAAGGTAAAGTTCAAGTATAAGGGTGAAGAGAAA
GAAGTAGACACTCAAAGATAAAGAAGGTTGGAGAGTAGGCCAAATGGTGTCC
5 TTTACCTATGACGACAATGGTAAGACAGGTAGAGGAGCTGTAAGCGAGAAAGAT
GCTCCAAAAGAATTATTAGACATGTTAGCAAGAGCAGAAAGAGAGAAGAAAGG
CGGCGGTGTCAGTCCCAAGGCCCTGGAGGAGGCCCTGGCCCCCGCCGA
AGGGGCCTCGTGGCTTGTGCTTCCGCAAGGAGCCCATGTGGCCGATCTT
CTGGCCCTGGCCGCCAGGGGGCCGGTCCACCGGGCCCCGAGCCTTAT
10 AAAGCCCTCAGGGACCTGAAGGAGGCCGGCTCTCGCCAAAGACCTGAGC
GTTCTGGCCCTGAGGGAAAGGCCCTGGCCTCCGCCGGCACGACCCATGCTCC
TCGCCTACCTCCTGGACCCTTCCAACACCAACCCCCGAGGGGGTGGCCCGCGCTA
CGGCGGGAGTGGACGGAGGAGGCCGGAGCGGGCCCTTCCGAGAGGC
TCTTCGCCAACCTGTGGGGAGGCTTGAGGGGGAGGAGAGGCTCCTTGGCTTA
15 CCGGGAGGTGGAGAGGCCCTTCCGCTGTCCTGGCCCACATGGAGGCCACGGG
GGTGCCTGGACGTGGCCTATCTCAGGGCCTGTCCTGGAGGTGGCCGAGGA
GATCGCCCGCCTCGAGGCCGGTCTCCGCCTGGCCGGCACCCCTCAACCTCA
ACTCCCGGACCAGCTGGAAAGGGCCTTGTGAGCTAGGGCTCCGCCAT
CGGCAAGACGGAGAACCGGCAAGCGCTCACCAGCGCCGCCGTGGAGGC
20 CCTCCCGAGGCCACCCATCGTGGAGAAGATCCTGCAGTACCGGGAGCTCAC
CAAGCTGAAGAGCACCTACATTGACCCCTGCCGGACCTCATCCACCCCAGGACG
GGCCGCCTCCACACCCGCTTCAACCAGACGCCACGCCACGGCAGGCTAAGT
AGCTCCGATCCAACCTCCAGAACATCCCCGTCCGCACCCGCTGGCAGAGGA
TCCGCCGGGCCTCATGCCGAGGAGGGTGGCTATTGGTGGCCCTGGACTATAG
25 CCAGATAGAGCTCAGGGTGCTGGCCACCTCTCCGGCACGAGAACCTGATCCG
GGTCTCCAGGAGGGCGGGACATCCACACGGAGACGCCAGCTGGATGTCGG
CGTCCCCCGGGAGGCCGTGGACCCCTGATGCCGGGGGCCAACCATCAA
CTTCGGGGCCTCTACGGCATGTCGCCACCGCCTCTCCAGGAGCTAGCCATC
CCTTACGAGGAGGCCAGGCCTTCAACAGCTAGGGCTTCCAGAGCTCCCAAGG
30 TGCGGGCCTGGATTGAGAACCCCTGGAGGAGGGCAGGAGGCCGGTACGTG
GAGACCCCTTCGCCGCCGCGCTACGTGCCAGACCTAGAGGCCGGGTGAAG
AGCGTGGAGGCCAGGCATGGCCTCAACATGCCGTCCAGGGCACC
GCCGCCGACCTCATGAAGCTGGCTATGGTAAGCTCTCCCCAGGCTGGAGGAA

ATGGGGGCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGTCTCGAGGCCCA
AAAGAGAGGGCGGAGGCCGTGGCCCGGCTGGCCAAGGAGGTATGGAGGGGGT
GTATCCCCCTGGCCGTGCCCTGGAGGTGGAGGTGGGATAGGGGAGGACTGGCT
CTCCGCCAAGGAGGGCATTGATGGCCGCGGAGGCAGGCATCATCATCATCA

5 TCATTAA

SEQ ID NO:10 The amino acid sequence of the Sac7d-ΔTaq fusion protein

MITNSTVKVKFKYKGEKEVDTISKIKVVWRVGKMSFTYDDNGKTGRGA
VSEKDA
PKELLDMLARAEREKKGGGVTPKALEEAPWPPPEGAFVGFLSRKEPMWA
10 DLLAAARGGRVHRAPEPYKALRDLKEARGLLAKDLSVLALREGLGLP
PPDPMLLAYLL
DPSNTTPEGVARRYGGEWTEEAGERAALSERLFANLWGRLEGEERLLWLY
REVERP
LSAVLAHMEATGVRLDVAYLRALSLEVAAEIIARLEAEVFRLAGHPFNL
NSRDQLERV
LFDELGLPAIGKTEKTGKRSTSAAVLEALREAHPIVEKILQYRELTKLKSTY
IDPLPDLI
HPRTGRLHTRFNQTATATGRLSSSDPNLQNPVRTPLGQRIRRAFIAEEGW
15 LLVALDY
SQIELRVLAHSGDENLIRVFQEGRDIHTETASWMFGVPREAVDPLMRRA
KTINFV
VLYGMSAHRLSQELAIPYEEAQAFIERYFQSFPKVRAWIEKTLEEGRRGY
VETLFGR
RRYVPDLEARVKSVREAAERMAFNMPVQGTAADLMKLAMVKLFPRLEEM
GARML
LQVHDELVLEAPKERAEEAVARLAKEVMEGVYPLAVPLEVEVGIGED
20 WLSAKEGIDRGGGGHHHHH

SEQ ID NO:11 The DNA sequence encoding the PL-ΔTaq fusion protein

ATGATTACGAATTCAAGAAAAAGAAAAAGAAAAAGCGTAAGAACGCAAAA
AAAAAGAAAGCGCCGGTGTCACTAGTGGCGCAACCGTAAAGTTCAAGTACA
AGCGAAGAAAAAGAGGTAGACATCTCAAGATCAAGAAAGTATGGCGTGTGG
25 GCAAGATGATCTCCTCACCTACGACGAGGGCGGTGGCAAGACCGGCC
CGGTAAAGCAGAAAGGACGCGCCGAAGGAGCTGCTGCAGATGCTGGAGAAGCAG
AAAAAGGGCGCGGTGTCACCAGTCCAAGGCCCTGGAGGAGGCCCTGGCCC
CCGCCGGAAGGGGCCTCGTGGCTTGTGCTTCCCGCAAGGAGGCCATGTGGG
CCGATCTCTGCCCTGCCGCCGCCAGGGGGGCCGGTCCACCGGCC
30 AGCCTTATAAAGCCCTCAGGGACCTGAAGGAGGCGGGGGCTCTGCC
ACCTGAGCGTTCTGCCCTGAGGGAAAGGCCTGGCCTCCGCCGGGACGACCC
CATGCTCCTCGCCTACCTCCTGGACCCTCCAACACCACCCCGAGGGGGTGGCC
CGGCGCTACGGCGGGAGTGGACGGAGGAGGCGGGGGAGCGGGCCCTTCC

GAGAGGCTTCGCCAACCTGTGGGGAGGCTTGAGGGGAGGAGAGGCTCCTT
 TGGCTTACCGGGAGGTGGAGAGGCCCTTCCGCTGTCCTGGCCCACATGGAGG
 CCACGGGGTGCCTGGACGTGGCTATCTCAGGGCCTGCCCCGGAGGTGGC
 CGAGGAGATGCCCGCCTCGAGGCCAGGTCTCCGCCCTGGCCGGCACCCCTC
 5 AACCTCAACTCCGGGACCAGCTGGAAAGGGCCTCTTGACGAGCTAGGGCTTC
 CCGCCATCGGCAAGACGGAGAAGACCGGAAGCGCTCCACCAGGCCGCCGTCC
 TGGAGGCCCTCCCGAGGCCACCCATCGTGAGAAGATCCTGCAGTACCGGG
 AGCTCACCAAGCTGAAGAGCACCTACATTGACCCCTGCCGACCTCATCCACCC
 CAGGACGGGCCGCTCCACACCCGCTCAACCAGACGGCACGGCACGGCAG
 10 GCTAAGTAGCTCGATCCAACCTCCAGAACATCCCCGTCCGCACCCGCTGGG
 CAGAGGATCCGCCGGCCTTCATGCCGAGGAGGGTGGCTATTGGTGGCCCTG
 GACTATAGCCAGATAGAGCTCAGGGTGCTGGCCACCTCTCCGGCAGCAGAAC
 CTGATCCGGGTCTTCAGGAGGGCGGGACATCCACACGGAGACGCCAGCTGG
 ATGTTCGCGTCCCCGGGAGGCCGTGGACCCCTGATGCCGCCGGCGCCAAG
 15 ACCATCAACTCGGGTCCTCTACGGCATGTCGGCCCACCGCCTCTCCAGGAGC
 TAGCCATCCCTTACGAGGAGGCCAGGCCTTCATTGAGCGCTACTTCAGAGCTT
 CCCAAGGTGCCGGCCTGGATTGAGAAGACCCCTGGAGGAGGGCAGGAGGCC
 GGTACGTGGAGACCCCTTCGGCCGCGCTACGTGCCAGACCTAGAGGCC
 GGGTGAAGAGCGTGGGGAGGCCGAGCGCATGGCCTCAACATGCCGTCC
 20 AGGGCACCGCCGCCACCTCATGAAGCTGGCTATGGTAAGCTCTCCCCAGGCT
 GGAGGAAATGGGGGCCAGGATGCTCCTTCAGGTCCACGACGAGCTGGCCTCGA
 GGCCCCAAAAGAGAGGGCGGAGGCCGTGGCCGGCTGGCCAAGGAGGTATGG
 AGGGGGTGTATCCCCTGGCGTGGCCCTGGAGGTGGAGGTGGGGATAGGGAGG
 ACTGGCTCTCCGCCAAGGAGGCCATTGATGCCGCCGGAGGCAGGCATCATC
 25 ATCATCATCATTAA

SEQ ID NO:12 The amino acid sequence of PL- Δ Taq fusion protein

MITNSKKKKKKRKKRKKKKKGGVTSGATVKFKYKGEKEVDISKIKKVWRVGK
 MISFTYDEGGGKTGRGAVSEKDAPKELLQMLEQKKGGVTSPKALEEAPWPPPEG
 30 AFVGFVLSRKEPMWADLLALAAARGGRVHRAPEPYKALRDLKEARGLLAKDLSVL
 ALREGLGLPPGDDPMLLAYLLDPSNTTPEGVARRYGGEWTEEAGERAALSERLFAN
 LWGRLEGEERLLWLWYREVERPLSAVLAHMEATGVRLDVAYLRALSLEVAEEIARLE
 AEVFRLAGHPFNLNSRDQLERVLFDELGLPAIGKTEKTGKRSTSAAVLEALREAHPIV

EKILQYRELTKLKSTYIDPLPDLIHPRTGRLHTRFNQTATATGRLSSSDPNLQNIPVRTP
LGQRIRRAFIAEEGWLLVALDYSQIELRVLAHLSGDENLIRVFQEGRDIHTETASWMF
GVPREAVDPLMRRAAKTINFGVLYGMSAHRLSQELAIPYEEAQAFIERYFQSFPKVR
AWIEKTLEEGRRRGYVETLFGRRRYVPDLEARVKSvreAAERMAFNMPVQGTAAD
5 LMKLAMVKLFPRLEEMGARMLLQVHDELVLEAPKERAEEAVARLAKEVMEGVYPL
AVPLEVEVGIGEDWLSAKEGIDGRGGGGHHHHHH

SEQ ID NO:13 PRIMER L71F

5'-CCTGCTCTGCCGCTTCACGC-3'

10

SEQ ID NO:14 PRIMER L71R

5'-GCACAGCGGCTGGCTGAGGA-3'

SEQ ID NO:15 PRIMER L18015F

15 5'-TGACGGAGGATAACGCCAGCAG-3'

SEQ ID NO:16 PRIMER L23474R

5'-GAAAGACGA TGGGTCGCTAACACGC-3'

20 **SEQ ID NO:17 PRIMER L18015F**

5'-TGACGGAGGATAAC GCCAGCAG-3'

SEQ ID NO:18 PRIMER L29930R

5'-GGGGTTGGAGGTCAATGGGTTTC-3'

25

SEQ ID NO:19 PRIMER L30350F

5'-CCTGCTCTGCCGCTTCACGC-3'

SEQ ID NO:20 PRIMER L35121R

30 5'-CACATGGTACAGCAAGCCTGGC-3'

SEQ ID NO:21 PRIMER L2089F

5'-CCCGTATCTGCTGGGA TACTGGC-3'

SEQ ID NO: 22 PRIMER L7112R

5'-CAGCGGTGCTGACTGAATCATGG-3'

SEQ ID NO:23 PRIMER L30350F

5' 5'-CCTGCCTGCCGCTTCACGC-3'

SEQ ID NO:24 PRIMER L40547R

5'-CCAATACCCGTTCA TCGCGGC-3'

10 **SEQ ID NO:25 PRIMER H-Amelo-Y**

5'-CCACCTCATCCTGG GCACC-3'

SEQ ID NO:26 PRIMER H-Amelo-YR

5'-GCTTGAGGCCAACCATCAGAGC-3'

15

SEQ ID NO:27 Human beta-globin primer 536F

5'-GGTTGGCCAATCTACTCCCAGG-3'

20

SEQ ID NO:28 Human beta-globin primer 536R

5'-GCTCACTCAGTGTGGCAAAG-3'

SEQ ID NO:29 Human beta-globin primer 1408R

5'-GATTAGCAAAAGGGCCTAGCTTGG-3'

25